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PATENT APPLICATION

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**WHAT IS CLAIMED IS :**

1. A method for controlling the functioning of a tire, comprising the step of:

- (a) determining estimations or measurements of the slip  $G_i$  and the coefficient of friction  $\mu_i$  prevailing at said slip, for at least one pair "i" of values  $(G_i, \mu_i)$  in a coordinate system having an axis  $G$ , an axis  $\mu$  and an origin;
- (b) determining the value of the slope  $\alpha_i$  of the straight line passing through the origin and through each pair of values  $(G_i, \mu_i)$ ;
- (c) calculating a coefficient  $B$  by direct calculation or by a regression from a sufficient number of pairs of  $(\alpha_i, G_i)$  so as to estimate the value of slope  $\alpha_0$  at the origin; and
- (d) using  $\alpha_0$  in an indicator of the longitudinal stiffness of the tread pattern.

2. A method for controlling the functioning of a tire according to Claim 1, in which the slope  $\alpha_i$  is determined by direct calculation  $\alpha_i = \mu_i/G_i$ .

3. A method for controlling the functioning of a tire according to Claim 1, in which the slope  $\alpha_i$  is determined by carrying out a suitable regression.

4. A method for controlling the functioning of a tire according to Claim 1, in which the following linear regression is carried out:

$$\Sigma_{GG} = \sum G_j^2, \Sigma_{G\mu} = \sum G_j \cdot \mu_j, \alpha_i = \frac{\Sigma_{G\mu}}{\Sigma_{GG}}$$

5. A method for controlling the functioning of a tire according to Claim 1, in which a coefficient  $B$ , representative of the longitudinal stiffness, is calculated by the following linear regression, applied to "n" measured or estimated points:

$$B^{\text{Lin}} = \frac{\sum \alpha \cdot \sum G^2 - \sum G \cdot \alpha \cdot \sum G}{n \cdot \sum G^2 - (\sum G)^2}$$

6. A method for controlling the functioning of a tire according to Claim 1, in which the coefficient B, representative of the longitudinal stiffness, is calculated by the following exponential regression, applied to "n" measured or estimated points:

$$B_{Exp} = \frac{\sum Ln(\alpha) \cdot \sum G^2 - \sum G \cdot \sum Ln(\alpha) \cdot \sum G}{n \cdot \sum G^2 - (\sum G)^2}$$

7. A method for controlling the functioning of a tire according to Claim 1, in which an average value of  $\alpha_0$  is determined and a comparison with reference values for the tire subject to processing is made, in order to estimate the wear rate.

8. A method for controlling the functioning of a tire according to Claim 7, wherein an estimation of the remaining height H of the tread pattern is made as follows:

$$H = H_0 \cdot \frac{Stiffness}{Stiffness_0}$$

9. A method for controlling the functioning of a tire according to Claim 7 or 8, in which an average value of  $\alpha_0$  is determined on the basis of a predetermined number of brakings or accelerations.

10. A method for controlling the functioning of a tire according to Claim 7 or 8, in which an average value of  $\alpha_0$  is determined on the basis of a predetermined distance.